CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER 83-16
NPDES NO. CA0038661
WASTE DISCHARGE REQUIREMENTS FOR:

NAPA SANITATION DISTRICT,
SLUDGE APPLICATION TO LAND,
NAPA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter Board) finds that:

1. Napa Sanitation District hereinafter called the discharger, by application dated May 11, 1983, has applied for waste discharge requirements and a permit to dispose sewage sludge under the National Pollutant Discharge Elimination System (NPDES).

2. The discharger operates a 8.0 million gallon per day trickling filter plant at Imola Avenue in Napa. The effluent is pumped about three miles south to a 340 acre oxidation pond system. Physical-chemical treatment is provided for the pond effluent, using lime for the removal of algae. Discharge is made to the Napa River. The lime-algae sludge is presently thickened and stored in a lagoon. Heavy metal concentrations in the lime-algae sludge are generally much lower than those found in sludges generated in normal sewage treatment.

3. The discharger proposes to apply thickened lime-algae sludge to two recently acquired agricultural parcels in conjunction with water reclamation projects. Site 1, 45 acres, is located just south of the oxidation ponds and west of the Napa County Airport. Site 2, 297 acres, is located immediately east of the oxidation ponds and physical-chemical treatment plant. Both sites are shown on the map (Attachment A) which is hereby made a part of this Order.

4. Site 1 is fairly flat, bordered by wetlands and the Napa River on the west. Fagan Creek is the major surface water drainage system and is tributary to Fagan Slough and thence the Napa River. The site is dominated by Haire soils consisting of acidic sandy-clay loam having low permeability. The pH of the soil ranges from 5.1 to 6.0. Groundwater at Site 1 is within a few feet of the surface and is generally of poor quality. The groundwater and adjacent surface waters are not used for agricultural or domestic purposes.

5. Site 2 is also fairly flat drained by Suscal Creek to the north and Sheehy Creek to the south, both ultimately draining to the Napa River to the west. The site is dominated by Haire soils consisting of acidic sandy-clay loam type soils. The pH of the soil ranges from 4.6 to 6.3. Groundwater at Site 2 is very close to the soil surface in wet weather months and drops to several feet during the irrigation season. One well is located on Site 2 and has been used for domestic as well as livestock water supply. This well is proposed to be sealed to the specifications of the Napa County Health Department and the water supply replaced by pipeline to the one ranch located on the site.

6. Thickened lime-algae sludge will be stored in lagoons during wet months (November 1 through May 30th). During the dry season (June 1 thorugh October 31) lime-algae sludge generated from the treatment plant as well as the lagoon sludge will be injected into the soil to depth of six to twelve inches using special truck-mounted equipment. The discharger has submitted a management plan which describes the proposed method and quantity of sludge application, the crops to be grown and an assessment of the heavy metal concentrations in sludge, soils and surface water. Sludge hauling and application will be done by the discharger, but all agricultural operations will be done by a farmer under arrangements with the District.

7. On October 13, 1982, administrative authorization was given to the discharger for the disposal of lime-algae sludge on Site 1, a 45 acre parcel, as shown on Attachment A. Napa County Department of Public Health has issued a permit for disposal of sludge on the site on June 2, 1982.

8. Section 405 of the Federal Clean Water Act provides that whenever the disposal of sludge from a publicly owned treatment works would result in any pollutant from such sludge entering waters of the United States, such disposal shall be regulated in accordance with a permit under the National Pollutant Discharge Elimination System (NPDES). Drainage from the proposed sludge disposal sites as described in Findings 3, 4 and 5 above would contain pollutants from sludge applied by the District, and said drainage would enter Fagan Creek and the Napa River, waters of the United States.

9. On September 13, 1979, U. S. Environmental Protection Agency (EPA), under authority of the Resources Conservation and Recovery Act of 1976 (PL94-58) and Section 405 of the Federal Clean Water Act issued an interim final regulations (40 CFR 257) related to sludge disposal practices of publicly owned wastewater treatment plants; "Criteria for Classifications of Solid Waste Disposal Facilities and Practices". The regulations include guidelines for sludge application to land used for the production of food-chain crops with limits on the amount of cadmium and polychlorinated biphenyls (PCB) that can be added to the soil. The limitations contained in this Order are consistent with the federal regulations cited above.

10. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on July 21, 1982. The Basin Plan contains water quality objectives for Fagan Creek, Suscol Creek, Sheehy Creek, and Napa River.

11. The beneficial uses of Sheehy Creek, Fagan Creek, Suscol Creek and Napa River in the vicinity of the discharge as contained in the Basin Plan are:

    a. Fish migration
    b. Fish spawning
    c. Wildlife habitat
    d. Preservation of rare and endangered species
    e. Cold freshwater habitat for fish

f. Warm freshwater habitat for fish
g. Navigation
h. Water contact recreation
i. Non-contact water recreation
j. Industrial water supply
k. Esthetic enjoyment

12. The discharger has conducted an initial study and prepared an Environmental Impact Assessment entitled "Lime Algae Sludge Disposal" dated December 22, 1981, in accordance with the California Environmental Quality Act (Public Resource Code Section 2100, et Seq.). A Negative Declaration was issued by the Discharger stating that the proposed project did not have a significant effect on the environment.

13. The Board finds that the potential adverse impacts on beneficial uses stemming from the discharger's project will be mitigated by measures incorporated into the project design or required by this Order.

14. This Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written comments and recommendations.

15. The Board in a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to provisions of the California Water Code, the Federal Water Pollution Control Act as amended, the Federal Resources Conservation and Recovery Act, and to regulations adopted thereunder, that the discharger shall comply with the following:

A. Prohibitions

1. Waste disposed of at the site shall be limited to lime-algae sludge generated by the discharger, unless prior written authorization is obtained from the Executive Officer. This authorization will be based upon submittal of technical data satisfactory to the Executive Officer, demonstrating compliance with all requirements of this Order.

2. No waste that contains contaminants in concentrations in excess of thresholds defined in the Environmental Protection Agency's Hazardous Waste List in 40 CFR 260-265 shall be disposed of on the site.

3. Crops grown on the site shall be limited to animal feed only.

4. Sludge shall not be applied to the disposal field between November 1 and May 1.

5. Sludge shall not be applied within 100 feet of any ditch, Fagan Creek, Suscol Creek, drainage channel or wetland.

6. Grazing animals shall not be permitted on the fields which have received sewage sludge within the preceeding thirty (30) days.

7. Milking animals shall not be allowed to graze on sludge amended parcels until twelve (12) months have elapsed after the last sludge application.

B. SEWAGE SLUDGE APPLICATION RESTRICTIONS

1. Neither the transport, handling, storage nor application of sewage shall cause a condition of pollution nor nuisance as defined by Section 13050(m) of the California Water Code.

2. The pH of the sludge and soil mixture shall be 6.5 or greater at the time of incorporation, except for sludge with cadmium concentrations of 2.0 mg/kg or less.

3. The annual Cadmium (Cd) application rate shall not exceed the following limits:

Time Period	Annual Cd Application rate (kg/ha)
Present to June 30, 1984	2.0(1.78 lb/Ac)
July 1, 1984 to Dec. 31, 1986	1.25(1.11 lb/Ac)
Beginning January 1, 1987	0.50(0.44 lb/Ac)

4. The maximum cumulative application of cadmium from sewage sludge shall not exceed 5 kg/ha.

5. Sludge containing concentrations of Polychlorinated Biphenyls (PCBs) equal to or greater than 10 mg/kg (dry weight) shall be incorporated into soil immediately when applied to land.

6. The application rate of sludge to farmland shall be based on type of crops grown, nitrogen demand of the crops and heavy metal concentration of the sludge. This rate shall be calculated, and documentation submitted each year for Executive Officer approval prior to any land application of the sludge.

7. No sludge shall be stored outside the designated lagoon area as shown on Attachment 'A'.

8. Ponded water from the sludge lagoon storage area(s) shall not enter or be discharged to the adjacent ditches.

9. Sludge shall be injected into soil to minimize wind erosion of sludge to surface waters.

10. The perimeter drainage ditches and other drainage facilities shall be maintained to convey the maximum anticipated rainfall runoff from the site and to prevent inundation of the site.

11. The application of sewage sludge shall not cause the degradation of any ground water so as to impair beneficial use.

12. All abandoned wells located within the disposal area shall be sealed to the satisfaction of the Napa County Department of Health Services and the California Department of Health Services.

13. The application of sludge to land shall not cause the following conditions to exist in waters of the United States at any place.

    a. Floating, suspended, or deposited macroscopic particulate matter or foam;

    b. Bottom deposits or aquatic growths;

    c. Alteration of temperature, and turbidity beyond present natural background levels;

    d. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

14. The discharge of waste shall not cause the following limits to be exceeded in waters of the United States in any place within one foot of the water surface:

a.	Dissolved oxygen	5.0 mg/l minimum. Annual median - 80% saturation. When natural factors cause lesser concentration(s) than those specified above, then this discharge shall not cause further reduction in the concentration of dissolved oxygen.
b.	Dissolved sulfide	0.1 mg/l maximum.
c.	pH	Variation from natural ambient pH by more than 0.5 pH units.
d.	Un-ionized Ammonia as N	0.025 mg/l annual median 0.4 mg/l maximum
e.	Nutrients	50 ug/l chlorophyll a maximum. When background levels exceed this requirement, then this discharge shall not add further nutrients.

15. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are

promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

C. PROVISIONS

1. The discharger shall comply with all portions of this Order immediately upon adoption.

2. The discharger shall file with the Regional Board technical reports on self-monitoring work performed according to detailed specifications as directed by the Executive Officer. Such reports shall include a site management plan to include plans for the upcoming dry season, and an assessment of the impacts of past sludge applications. This report shall be submitted by May 15, of any year in which sludge is proposed to be discharged.

3. The discharger shall file with this Board a report of any material change or proposed change in the character, treatment, or volume of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries, or ownership of the property.

4. The discharger shall permit the Board, the Environmental Protection Agency or its authorized representative in accordance with California Water Code Section 13267(c):

   a. Entry upon premises in which an effluent source is located or which any required records are kept;

   b. Access to copy any records required to be kept under terms and conditions of this Order;

   c. Inspection of monitoring equipment or records; and

   d. Sampling of discharge, soil or agricultural crop.

5. These requirements do not exempt the operator of this waste disposal facility from compliance with any other laws, regulations, or ordinances which may be applicable; they do not legalize this waste disposal facility, and they leave unaffected any further restraint on the disposal of wastes at this site which may be contained in other statutes or required by other agencies.

6. In accordance with Section 13263 of the Water Code, these requirements are subject to periodic review and revision by this Regional Board. The Board shall take into consideration the results of the self-monitoring program whenever these periodic reviews occur.

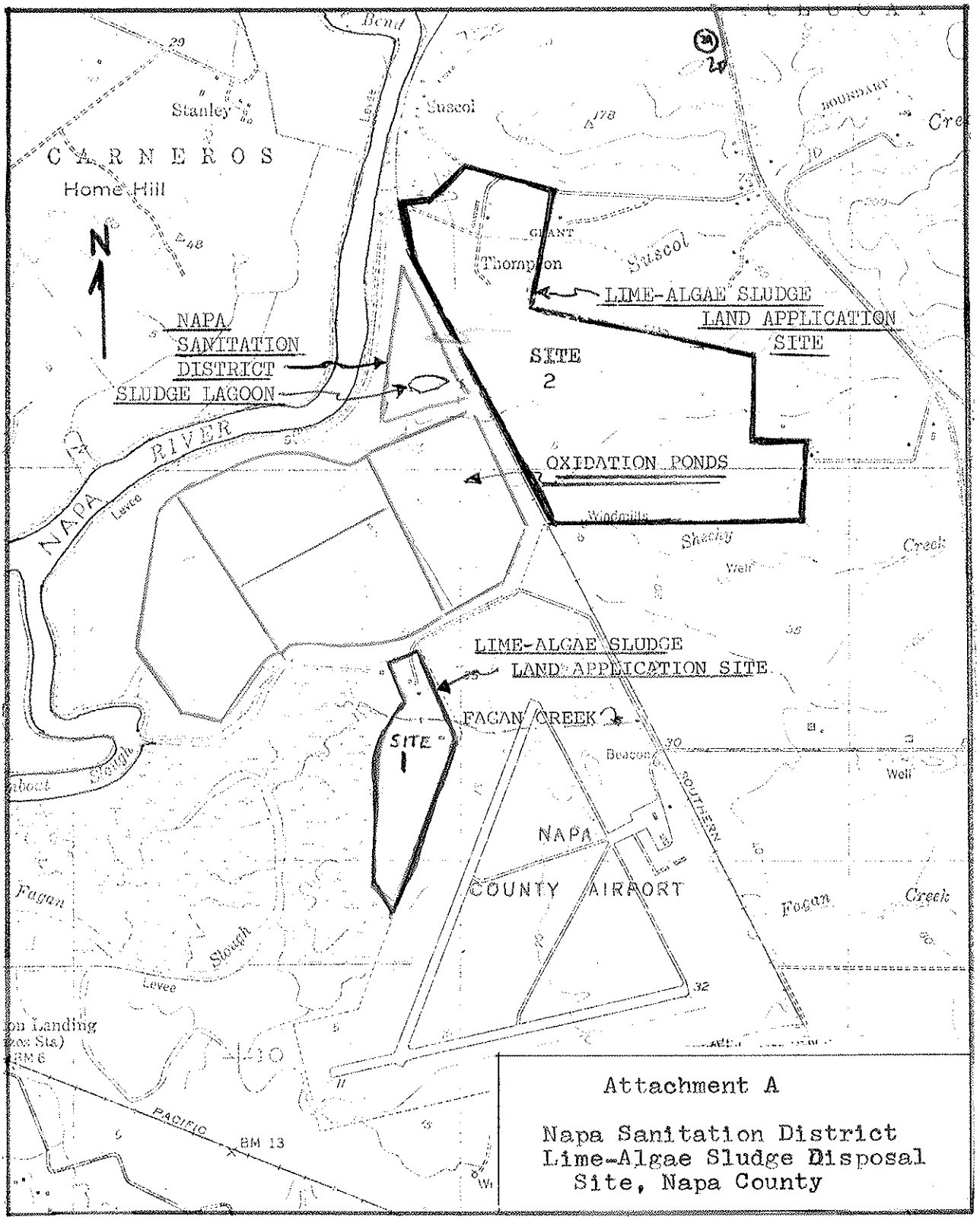
7. This Order expires June 23, 1988. The discharger must file a Report of Waste Discharge in accordance with the Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days in advance of such expiration date.

8. This Order shall serve as a National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Water Pollution Control Act or amendments thereto, and shall become effective 10 days after date of its adoption provided the Regional Administrator, Environmental Protection Agency, has no objection.

I, Fred H. Dierker, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 23, 1983.

FRED H. DIERKER
Executive Officer

Attachments:
A. Site Map


Stanley
CARNEROS
Home Hill
N
NAPA SANITATION DISTRICT SLUDGE LAGOON
LIME-ALGAE SLUDGE LAND APPLICATION SITE
SITE 2
OXIDATION PONDS
NAPA RIVER
Levee
Windmills
Shaehy
Creek
Well
LIME-ALGAE SLUDGE LAND APPLICATION SITE
FAGAN CREEK
SITE 1
Beacon
Well
SOUTHERN
NAPA COUNTY AIRPORT
Fagan
Slough
Levee
Fagan Creek
PACIFIC
BM 13
Attachment A
Napa Sanitation District
Lime-Algae Sludge Disposal
Site, Napa County

Monitoring Program for Sludge Management Project to
Fegundes and Somky Ranches

PART A

I. GENERAL

All analysis shall be performed by an approved (certified) laboratory using generally acceptable methods or current EPA/State guidelines and procedures for sampling and analysis of sludge, soil, water and plants.

II. REPORTING

A single annual report shall be submitted to the Board. This report shall be prepared by, or under the supervision of, a soil scientist, agronomist, soils engineer, or other individual having a recognized expertise on the impacts of sewage sludge on soils and on surface and groundwaters. The annual report shall be submitted no later than April 1 of each year, and shall include the following:

1. Annual Management Plan Update

This section shall describe the method of operation for the upcoming season and include the following:

a. Fields to which sludge is to be applied and the crop to be grown.

b. Sludge loading rate to be used, expressed in dry tones per field and as Kg/ha.

c. Method proposed for incorporating sludge into soil.

d. Field for which soil sampling is planned in the coming dry weather season.

e. Any changes to past practices that have been identified as being needed in the subsequent portion of the report.

2. Report on Impact of Previous Sludge Application

The overall intent of this section is to provide a comprehensive annual assessment of the project. This section shall include data presentation and a narrative evaluation of the sludge applied to the land, and of the impacts on soils, water, and crops. Where appropriate, data presentation and discussion shall be specific to individual fields. If problems are found to exist, proposed solutions shall be included.

a. Sludge

Present data on sludge composition. All data shall be presented, and any anomolies found shall be discussed.

b. Soils

For each field, the following table shall be completed based on the most recent data obtained:

Field_____ Last date sampled_____

Parameter	Prior Cumulative loading, kg/ha	Soil Concentration mg/kg "0-24"
sludge added as dry solids		
Ammonium-N		
Organic-N		
Nitrate-N		
TKN		
Phosphorous		
Potassium		
Zinc		
Copper		
Nickel		
Cadmium		
Lead		
Chromium		
pH		

The data presented above shall be evaluated and discussed. This discussion shall include whether the project has had any affect on soil texture or workability. Any change in soil pH shall be described.

c. Accounting for Heavy Metals

An accounting shall be made in the sludge applied for each field, and be based on the cumulative total sludge applied. This accounting shall include the following possible sinks:

(1) Retained in the soil

(2) Lost from the site with the crop

(3) Lost from the site in runoff water

(4) Present in soluable form in underlying groundwater

PART B

SAMPLING AND ANALYSIS

I. Sludge

During the period in which sludge is being applied to the land directly from the thickener, sampling and analysis shall be performed once each quarter over five consecutive days as follows:

Equal volumes of the daily composite (3 grab samples at equal intervals during 8 hour shift) from thickener or truckload leaving plant shall be combined into a five day composite. This shall be analyzed for the following:

pH	Percent Solids
TKN	Nitrate-N
Potassium	Total Zinc
Total Copper	Total Nickel
Total Cadmium	Total Lead
Total Chromium	

All the results shall be expressed as mg/kg except for pH and Percent Solids.

The lime-algae sludge storage lagoons shall be sampled annually immediately prior to spreading each year. The lagoons shall be sampled at twenty representative points. These samples shall be combined into a composite and analyzed for the following:

pH	Percent Solids
TKN	Nitrate-N
Potassium	Total Zinc
Total Copper	Total Nickel
Total Cadmium	Total Lead
Total Chromium	

All the results shall be expressed as mg/kg except for pH and Percent Solids.

An analytical sensitivity for heavy metals of 0.1 mg/kg shall be adequate.

II. Soils

1. Comprehensive Testing

a. Comprehensive testing shall be done prior to sludge application for any given field(s) or type of soil to define conditions that prevailed prior to the commencement of this monitoring program. After this initial testing, comprehensive testing shall be conducted each time that approximately 45 dry tons of sludge per acre has been applied to the fields. Under current plans, this corresponds to once every nine year testing.

2. Fields

The two ranches shall be split into three (3) fields as shown on the attached map. Each field has been laid out so that for the most part it includes only one soil type. Buffer areas are marked in yellow, creeks in blue, and GD-well stations in read

Field Number (1) is approximately 45 acres after buffer areas are set aside.

Field Number (2) is approximately 153 acres after buffer areas are set aside.

Field Number (3) is approximately 130 acres after buffer areas are set aside.

a. For any given field(s) to be sampled, two diagonal transects shall be established. Along each transect, and spaced equidistantly, a minimum of ten soil samples shall be taken at 0" to 24" depth. Soil samples shall be composited and analyzed for the parameters specified below.

Parameter	Units
pH	pH unit
Acidity or Basicity	mg/kg as CaC03
CEC	meq/100 gm.
Electric Conductivity	Millimhos/cm @ 25 C
Texture (1)	
Ammonium-N	mg/kg
Organic-N	mg/kg
Nitrate-N	mg/kg
TKN	mg/kg
Total-P	mg/kg
Total-K	mg/kg
Cd	mg/kg
Total-Cr	mg/kg
Cu	mg/kg
Ni	mg/kg
Pb	mg/kg
Zn	mg/kg

(1) To be analyzed only once per field to obtain background information in order to determine the variability in the field.

III. Groundwater

1. Sampling Stations

Stations	Location
GD-1	at the Southwesterly corner of the Fegundes ranch

GD-2	on the westerly property line of the Fegundes Ranch approximately 1400 feet North of GD-1
GD-3	in the West corner at the intersection of the access road and Fagen Creek
GD-4	on the Westerly property line of the Fegundes Ranch 100 feet North of Fagen Creek
GD-C1	control well located on the Easterly property line 75 feet North of Fagen Creek
GD-5	50 feet North and East of the Southwest property line on the Somky Ranch
GD-6	a point approximately 1100 feet north of the Southerly property line at the Westerly property line
GD-7	a point approximately 75 feet south of the intersection of Soscol Creek and the Westerly property line
GD-8	the domestic well located on the Marie Somky Life Estate
GD-C2	control well located on the East side of the access road approximately 75 feet North of the hay barn

The depth of these G wells shall be as deep as necessary to reach at least 2 feet below the dry weather water table. The wells shall be contructed so as to exclude surface runoff and should be minimum of four inches diameter.

All "G" wells shall be sampled once each quarter.

NOTE: Standing water in each well shall be flushed prior to taking samples.

2. Analysis

Parameter	Unit
Depth to water	ft.
pH	pH unit
Conductivity	mhos/cm at 25 C
Cd	mg/l
Total Cr	mg/l
Cu	mg/l
Zn	mg/l
NITRATE-N	mg/l

I, Roger B. James, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

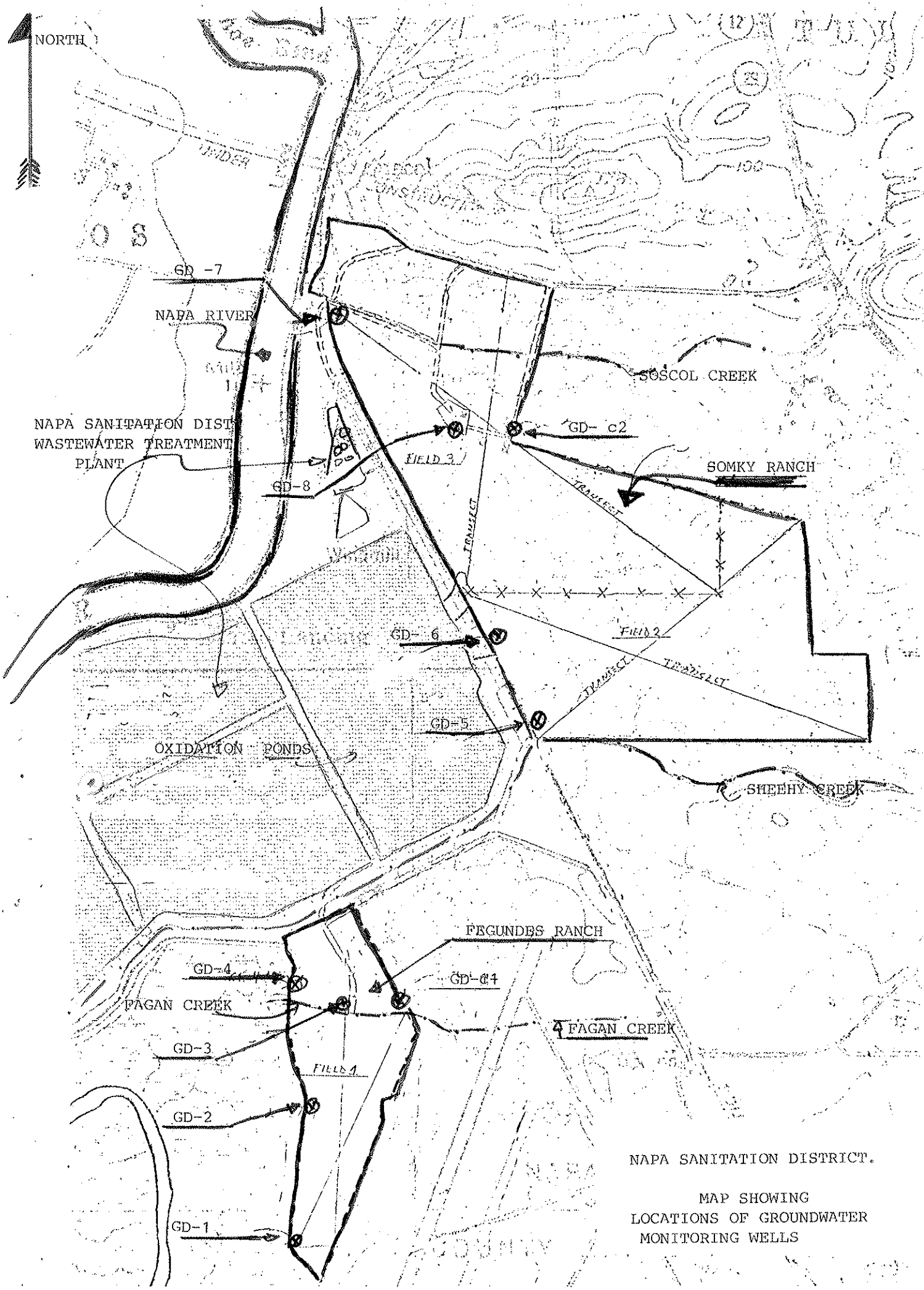
1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with sludge disposal specifications established in the Board's Order No. 83-16.

2. Is effective on the date shown below.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer.

ROGER B. JAMES
Executive Officer

Attachment:
Map of the Napa SD-Fequndas & Somky Ranch
with sampling location(s)



NAPA SANITATION DISTRICT.

MAP SHOWING
LOCATIONS OF GROUNDWATER
MONITORING WELLS